

Scientific Notation and Significant Figures

Name: Key

Chapter 1

Date: _____ Period: _____

Practice Problems

I. Scientific Notation & Significant Digits

A. Express each of the following numbers in scientific notation and the correct number of significant digits

- | | | |
|-------------------|--|----------|
| 1. 2370 m | <u>$2.37 \times 10^3 \text{ m}$</u> | <u>3</u> |
| 2. 0.3 g | <u>$3 \times 10^{-1} \text{ g}$</u> | <u>1</u> |
| 3. 140.02 m/s | <u>$1.4002 \times 10^2 \text{ m/s}$</u> | <u>5</u> |
| 4. 0.000 045 amp | <u>$4.5 \times 10^{-5} \text{ A}$</u> | <u>2</u> |
| 5. 0.000 00707 mL | <u>$7.07 \times 10^{-6} \text{ mL}$</u> | <u>3</u> |

B. Express each of the following in ordinary notation

- | | | |
|--------------------------------------|--|----------|
| 1. $5.63 \times 10^{-3} \text{ m}^2$ | <u>$.00563 \text{ m}^2$</u> | <u>3</u> |
| 2. $6.7 \times 10^5 \text{ cm}$ | <u>670000 cm</u> | <u>2</u> |
| 3. $1.01 \times 10^3 \text{ mg}$ | <u>1010 mg</u> | <u>3</u> |
| 4. $2.002 \times 10^{-4} \text{ kg}$ | <u>$.002002 \text{ kg}$</u> | <u>4</u> |

C. Perform the indicated operations. Place all answers in proper scientific notation. Include units where appropriate.

1. $(2.60 \times 10^{-3} \text{ m})(1.2 \times 10^4 \text{ m})$ $3.12 \times 10^1 \text{ m} = 3.1 \times 10^1 \text{ m}$
- \uparrow 3 sig figs \uparrow 2 sig figs \uparrow so 2 sig figs

4. Convert $3.00 \times 10^8 \text{ m/s}$ (the speed of light) to mph.

$$\frac{3 \times 10^8 \text{ m}}{\text{sec}} \times \frac{1 \text{ mi}}{1610 \text{ m}} \times \frac{3600 \text{ sec}}{1 \text{ hr}} = 670807453.4 \text{ mph} = \boxed{6.708 \times 10^8 \text{ mph}}$$

5. Convert 2.03 m/s^2 to miles per hour/second.

$$\frac{2.03 \text{ m}}{\text{s}} \cdot \frac{1}{\text{s}} \times \frac{1 \text{ mi}}{1610 \text{ m}} \times \frac{3600 \text{ s}}{1 \text{ hr}} = \boxed{4.539 \text{ mi/h} \cdot \text{s}}$$

III. Algebraic Conversions: Solve for the algebraic quantity in bold.

1. $F = ma$,

$$\mathbf{a} = \frac{F}{m}$$

2. $^{\circ}\text{F} = 1.8^{\circ}\text{C} + 32$, $^{\circ}\text{C} =$

$$\frac{^{\circ}\text{F} - 32}{1.8^{\circ}} = ^{\circ}\text{C}$$

3. $V = lwh$, $\mathbf{h} =$

$$\mathbf{h} = \frac{V}{lw}$$

4. $v_f = v_i + at$, $\mathbf{a} =$

$$\mathbf{a} = \frac{v_f - v_i}{t}$$

5. $v_f^2 = v_i^2 + 2ad$, $\mathbf{d} =$

$$\frac{v_f^2 - v_i^2}{2a} = \mathbf{d}$$

6. $d = v_i t + \frac{1}{2}gt^2$ $\mathbf{g} =$

$$2d - 2v_i t = gt^2$$

$$\mathbf{g} = \frac{2d - 2v_i t}{t^2}$$

5. Write the equation of the line.

$$x = 48t$$

← ALSO COULD VARY, USE THE
SLOPE YOU OBTAINED IN
PART 3.

$$y = mx + b$$

$$\text{Position} = 48(\text{Time}) + 0$$

